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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/650,936	08/27/2003	Li Zou	2620P	8078

47389 7590 03/21/2007
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EXAMINER

LEUNG, WAI LUN

ART UNIT	PAPER NUMBER
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2613

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/21/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/650,936	Applicant(s) ZOU ET AL.	
	Examiner Danny Wai Lun Leung	Art Unit 2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 December 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-14, and 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent Number 6,744,986 to **Vohra**, in view of US Patent Number 5,943,149 to **Cearns et al.**

Regarding to claim 16, **Vohra** teaches an upgradeable optical add/drop module (30, fig 5), comprising:

an optical input (*input of WDM 38, fig 5*) and an optical output (76, fig 5);
a demultiplexer section (*WDM 38, fig 5*); and
a multiplexer section (*WDM 78, fig 5*).

Vohra further teaches wherein each of the transmission ports of the demultiplexer (16, fig 5) are optically coupled to the transmission ports of the multiplexer (72, fig 5).

Vohra does not disclose expressly the details regarding the multiplexer section and the demultiplexer section.

Cearns, from the same field of endeavor, teaches a configuration of optical multiplexer/demultiplexer using a narrow band filter followed by a wideband filter (*see title*), wherein the optical demultiplexer comprises:

a first bandpass filter (20, fig 5) with a first pass band (λ_1 - λ_8) and optically coupled to the optical input (col 5, ln 23-29), comprising a first reflection port (on the left) and a first transmission port (on the right),

a first cascaded series of channel filter assemblies (the series of filter shown on the right of fig 5) optically coupled to the first transmission port (outputting λ_1 - λ_8 , fig 5),

a third bandpass filter (the first filter on the series of filters shown on left of fig 5) with a second pass band (λ_{11} - λ_{16}) and optically coupled to the first reflection port (optically coupled to the left side port of 20 as shown in fig 5), comprising a third transmission port (on the right), and

a third cascaded series of channel filter assemblies (the remaining series of 5 filters as shown on the left of fig 5) optically coupled to the third transmission port,

wherein the first bandpass filter separates a composite optical input signal into a first subset of channels (λ_1 - λ_8) and a second subset of channels (λ_{10} - λ_{16}), wherein the first subset of channels is transmitted to the first cascaded series of channel filter assemblies via the first transmission port and the second subset of channels is reflected to the third bandpass filter via the first reflection port (col 5, ln 25-29),

wherein the third bandpass filter separates the second subset of channels (λ_{10} - λ_{16}) into a third subset of channels (λ_{11} - λ_{16}) and a fourth subset of channels (λ_{10}), wherein the third subset of channels is transmitted to the third cascaded series of channel filter assemblies via the transmission port (as shown in fig 5) and the fourth subset of channels is reflected from the third bandpass filter (Cearns also describes in col 5 ln 51-col 6 ln 11 that numerous other embodiments with other numbers of subsets of channels may also be

implemented, where the filtering, transmitting, and reflecting of the third bandpass filter may be performed with similar fashion to that of the first bandpass filter, emphasis on col 5, ln 54-62).

Cearns further teaches that multiplexing can be performed with the same invention with corresponding components, since filter performs the same function for light traveling in the opposite direction (*col 2, ln 33-35*). *It would have been obvious for a person of ordinary skill in the art to develop a multiplexer in view of **Cearns**' detailed description of a demultiplexer, since **Cearns** teaches that the same method may apply to multiplexing and demultiplexing (col 2, ln 65-67).*

Therefore, it would have been obvious for a person of ordinary skill in the art at the time of invention to use **Cearns**' demultiplexer and multiplexer onto **Vohra**'s system. The motivation for doing so would have been to apply the advantage of **Cearns**'s WDM demultiplexer and multiplexer, in which closely spaced channels can be separated and combined using conventional dichroic filters, onto **Vohra**'s OADM system such that channel spacing can be improved.

Claims 1, 3-14, and 17 are rejected for the same reasons as stated above regarding claim 16, because the recitations of the combined teachings of **Vohra** and **Cearns** as discussed above reads on the claimed limitations of claims 1, 3-14, and 17, where **Cearns**' teaching of optical multiplexer/demultiplexer using bandpass filters and cascaded series of channel filter assemblies are applied to **Vohra**'s OADM system with respective transmission ports communicating the respective channels. **Cearns**' fig 5 also explicitly show that the cascaded series of channel filter assemblies transmit one channel of the subset of channels and reflects other channels of the subset, as recited in claims 5, 7, 10, and 12.

Furthermore, **Cearns** teaches other embodiments using further narrow band filters for accommodating a plurality of subsequent additional channels may be implemented (*col 5, ln 51-67*). It would have been obvious to combine **Vohra** and **Cearns** for the same reason as stated regarding claim 16.

As to claims 2 and 17, **Vohra** further teaches the module of claim 1, further comprising an optical switching unit (*12, fig 5*) optically coupled between the demultiplexer (*38, fig 5*) and the multiplexer (*78, fig 5*), where the first and third cascaded series of channel filter assemblies is in the demultiplexer (*38*), and the second and fourth cascaded series of channel filter assemblies is in the multiplexer (*78*), *as taught by Cearns in the combined teaching of Vohra and Cearns*, such that **Vohra**'s optical switching unit (*12*) is between the first and second cascaded series of channel filter assemblies, and between the third and fourth cascaded series of channel filter assemblies *in the combined teaching of Vohra and Cearns*.

As to claims 18-19, **Vohra** further teaches wherein the optical switching unit is configured to transmit a plurality of channels from the demultiplexer to the multiplexer in a selected order (*col 4, ln 65-col 5, ln 6, since the operation is controlled by a computer, the order of the transmission is depended upon the control command of the computer*), where the demultiplexer comprises the first cascaded series of channel filter assemblies, and the multiplexer comprises the second cascaded series of channel filter assemblies *as taught by Cearns as discussed above; wherein the selected order is a reverse order sequence is merely an engineering design choice*.

3. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent Number 6,744,986 to **Vohra**, in view of US Patent Number 5,943,149 to **Cearns** et al., applied to claim 1 as discussed above, and further in view of applicant's admitted prior art fig 3.

Regarding to claim 15, the combination of **Vohra** and **Cearns** discloses the module of claim 1 as discussed above. **Cearns** further discloses wherein at least one of the channel filter assemblies comprises a plurality of optical fibers and GRIN lenses (*col 2, ln 49-52*).

The combination does not disclose expressly wherein at least one of the channel filter assemblies comprises: a first capillary tube comprising a plurality of optical fibers; a second capillary tube comprising at least one optical fiber; a first quarter pitch GRIN lens optically coupled to the first capillary tube; a second quarter pitch GRIN lens optically coupled to the second capillary tube; and an optical fiber optically coupled to the first and second GRIN lenses.

Applicant's admitted prior art fig 3, from the same field of endeavor, teaches that it is common and well known that a channel filter assemblies may comprise:

- a first capillary tube (*302a*) comprising a plurality of optical fibers (*308, 310*);
- a second capillary tube (*302b*) comprising at least one optical fiber (*312*);
- a first quarter pitch GRIN lens (*304a*) optically coupled to the first capillary tube;
- a second quarter pitch GRIN lens (*304b*) optically coupled to the second capillary tube;

and

- an optical filter (*306*) optically coupled to the first and second GRIN lenses.

Therefore, it would have been obvious for a person of ordinary skill in the art at the time of invention to recognized that, although not explicitly shown, at least one of **Cearns'** channel filter assemblies (*fig 5*) may comprise a first capillary tube comprising a plurality of optical

fibers (for example, the fiber that is carrying channels λ_{10} - λ_{16} in fig 5 of **Cearns** may be comprised of a first capillary tube as suggested by the prior art figure); a second capillary tube comprising at least one optical fiber (for example, the fiber that is carrying channel λ_{11} in fig 5 of **Cearns** may be comprised of a second capillary tube as suggested by the prior art figure); a first quarter pitch GRIN lens optically coupled to the first capillary tube (the first filter from the top in the filter assemblies filtering λ_{10} - λ_{16} in fig 5 of **Cearns** may comprise a first capillary tube that is coupled to a GRIN lens as suggested by the prior art figure); a second quarter pitch GRIN lens optically coupled to the second capillary tube (the second filter from the top in the filter assemblies filtering λ_{11} - λ_{16} in fig 5 of **Cearns** may comprise a second capillary tube that is coupled to a GRIN lens as suggested by the prior art figure); and an optical fiber optically coupled to the first and second GRIN lenses (the fiber that is optically coupled to the first two filters in the filter assemblies of **Cearns**, where the two filters comprises the first and second GRIN lenses). The motivation for doing so would have been to recognize that GRIN lens helps focus and collimate optical signals, while capillary tube helps protect the fiber, therefore GRIN lens and capillary tube are essential to any channel filter assemblies such as that of **Cearns**', as used in the combination of **Vohra** and **Cearns**.

Response to Arguments

4. Applicant's arguments filed 12/20/2006 have been fully considered but they are not persuasive.
5. Applicant concur that **Cearns** discloses demultiplexing a multiplexed optical signal by utilizing a plurality of bandpass filters and a plurality of cascading bandpass filter arrangement (page 9 of reply filed 12/20/2006). However, applicant argues that **Cearns**' teachings does not

include the limitation of a multiplexer configured to receive a demultiplexed signal from the cascaded series of channel filter assemblies.

The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

Since **Cearns** illustrated that a demultiplexer may comprise a plurality of bandpass filters and a plurality of cascading bandpass filter arrangement (*fig 4-6*), it would have been obvious for a person of ordinary skill in the art to realized that a multiplexer may comprise of similar filtering assemblies, and therefore apply such filtering assemblies onto **Vohra's** system as WDM units (38 & 78).

6. In response to applicant's argument that **Cearns'** invention is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, **Cearns** explicitly illustrated that a demultiplexer may comprise of a plurality of bandpass filters and cascaded series of channel filter assemblies, in addition to the circuitry which eliminates the loss of a channel.

7. In response to applicant's argument that **Cearns** does not teach or suggest a reflection port that is configured to be connectable to a further bandpass filter in order to accommodate a plurality of additional channels, as recited in claim 1. Applicant is directed to **Cearns'** col 5, In

Art Unit: 2613

50-67, which stated that further band pass filters maybe used in other embodiments to further separate sub-groups of channels. Therefore, it would have been obvious for a person of ordinary skill in the art to use a further bandpass filter in order to accommodate a plurality of additional channels as suggested by **Cearns**.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Danny Wai Lun Leung whose telephone number is (571) 272-5504. The examiner can normally be reached on 9:30am-9:00pm Mon-Thur.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2613

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DWL

March 5, 2007


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